Chapter 14: Introduction to organic chemistry

Homework questions

1 The compound $C_3H_6O_2$ has three isomeric compounds. Two of them are esters whilst the other is a carboxylic acid.

a **i** Define the term **structural isomerism**. [2]

ii Write down the structural formulae of the **three** isomers described above. [3]

iii Draw the skeletal formula of each isomer. [3]

b What volume of carbon dioxide is given by 60 cm^3 of each of these compounds when each is burned in oxygen? Show your working. [3]

c When one of the hydrogen atoms in the carboxylic acid with the molecular formula $C_3H_6O_2$ is replaced by a chlorine atom, the resulting molecule exhibits a form of stereoisomerism.

i Define the term **stereoisomerism**. [2]

ii Name the form of stereoisomerism exhibited by $C_3H_5O_2Cl$ and explain your choice. [3]

iii Draw the two isomers. [3]

Total = 19

2 There are **four** structural isomers with the molecular formula C_5H_{10} and a carbon–carbon double bond.

a Write down the structural formula, skeletal formula and name of each isomer. [12]

b One of the structural isomers exhibits *cis–trans* isomerism.

i State the **two** properties necessary for a compound to exhibit *cis–trans* isomerism. [2]

ii Which one of the isomers exhibits *cis–trans* isomerism? [1]

iii Draw their skeletal formulae and name each one. [4]

Total 19